

**CLAIMS**

What is claimed is:

- 1 1. A method for simultaneous debugging of an electrical design having both an HDL  
2 portion and a general programming language portion, comprising:  
  
3 interrupting a simulator handling the HDL portion, the simulator interrupted by an  
4 external debugger, the external debugger for debugging the general language portion;  
  
5 handling a simulator request with an external debugger, the external debugger calling  
6 a request processing function at the simulator; and  
  
7 executing the request processing function at the simulator to respond to the simulator  
8 request.
- 1 2. The method of claim 1 in which the simulator request accesses a portion of the HDL  
2 portion.
- 1 3. The method of claim 2 in which the simulator request accesses HDL signal values.
- 1 4. The method of claim 2 in which the simulator request accesses HDL design  
2 hierarchy.
- 1 5. The method of claim 1 in which the simulator request operates simulator  
2 functionality.
- 1 6. The method of claim 1 in which the general programming language portion  
2 comprises C, C++, or SystemC code.

1 7. The method of claim 1 in which the HDL portion comprises VHDL or Verilog.

1 8. The method of claim 1 in which the action of having the external debugger call the  
2 request processing function is based upon recognition of a waiting simulator request.

1 9. The method of claim 8 in which recognition of the waiting simulator request is based  
2 upon a message sent to the external debugger.

1 10. The method of claim 8 in which recognition of the waiting simulator request is based  
2 upon a periodic check of a simulator request wait queue.

1 11. The method of claim 8 in which recognition of the waiting simulator request is based  
2 on whether a threshold number of simulator requests are waiting in a simulator request wait  
3 queue.

1 12. The method of claim 1 in which the simulator request is generated at a simulator  
2 GUI.

1 13. The method of claim 12 in which the response to the simulator request is displayed at  
2 the simulator GUI.

1 14. The method of claim 1 in which the external debugger calls the request processing  
2 function at the simulator with the following statement:

3 call *expr*

1 15. The method of claim 1 in which the simulator request is routed through a debugger  
2 GUI for the external debugger.

1 16. The method of claim 1 in which the simulator request is directly routed to the  
2 external debugger.

1 17. The method of claim 1 in which the request processing function is set up ahead of  
2 time at the simulator to handle anticipated simulator requests.

1 18. A method for simultaneous processing of a design that is based upon multiple  
2 programming languages, the multiple programming languages comprising a first language  
3 portion and a second language portion, in which processing of the second language portion  
4 interrupts processing of the first language portion, the method comprising:

5 processing the second language portion of the design causing an interruption of  
6 processing for the first language portion;

7 determining whether there are one or more waiting requests for processing of the  
8 first language portion;

9 handling the one or more waiting requests for processing of the first language portion  
10 by having processing of the second language portion call a request processing function at the  
11 first language portion; and

12 executing the request processing function at the first language portion to process the  
13 one or more waiting requests.

1 19. The method of claim 18 in which the one or more waiting requests are for accessing  
2 data from the first language portion of the design.

1 20. The method of claim 18 in which the one or more waiting requests are for debugging  
2 the first language portion.

1 21. The method of claim 18 the act of determining whether there are one or more waiting  
2 requests for processing of the first language portion is based upon a message sent to the  
3 processing of the second language portion.

1 22. The method of claim 18 the act of determining whether there are one or more waiting  
2 requests for processing of the first language portion is based a periodic check of a request  
3 wait queue for the first language portion.

1 23. The method of claim 18 the act of determining whether there are one or more waiting  
2 requests for processing of the first language portion is based on whether a threshold number  
3 of simulator requests are waiting in a request wait queue.

1 24. The method of claim 18 in which the request processing function is called with the  
2 following statement:

3 call *expr*

1 25. The method of claim 18 in which processing the second language portion comprises  
2 debugging the second language portion.

1 26. The method of claim 18 in which the request processing function is set up ahead of  
2 time to handle anticipated requests.

1 27. A computer program product comprising a computer usable medium having  
2 executable code to execute a process for simultaneous debugging of an electrical design  
3 having both an HDL portion and a general programming language portion, the process  
4 comprising:

5 interrupting a simulator handling the HDL portion, the simulator interrupted by an  
6 external debugger, the external debugger for debugging the general language portion;

7 handling a simulator request with an external debugger, the external debugger calling  
8 a request processing function at the simulator; and

9 executing the request processing function at the simulator to respond to the simulator  
10 request.

1 28. A system for simultaneous debugging of an electrical design having both an HDL  
2 portion and a general programming language portion, comprising:

3 means for interrupting a simulator handling the HDL portion, the simulator  
4 interrupted by an external debugger, the external debugger for debugging the general  
5 language portion;

6 means for handling a simulator request with an external debugger, the external  
7 debugger calling a request processing function at the simulator; and

8 means for executing the request processing function at the simulator to respond to  
9 the simulator request.

1 29. A computer program product comprising a computer usable medium having  
2 executable code to execute a method for simultaneous processing of a design that is based  
3 upon multiple programming languages, the multiple programming languages comprising a  
4 first language portion and a second language portion, in which processing of the second  
5 language portion interrupts processing of the first language portion, the method comprising:

6 processing the second language portion of the design causing an interruption of  
7 processing for the first language portion;

8 determining whether there are one or more waiting requests for processing of the  
9 first language portion;

10 handling the one or more waiting requests for processing of the first language portion  
11 by having processing of the second language portion call a request processing function at the  
12 first language portion; and

13 executing the request processing function at the first language portion to process the  
14 one or more waiting requests.

1 30. A system for simultaneous processing of a design that is based upon multiple  
2 programming languages, the multiple programming languages comprising a first language  
3 portion and a second language portion, in which processing of the second language portion  
4 interrupts processing of the first language portion, the method comprising:

5 means for processing the second language portion of the design causing an  
6 interruption of processing for the first language portion;

7 means for determining whether there are one or more waiting requests for processing  
8 of the first language portion;

9 means for handling the one or more waiting requests for processing of the first  
10 language portion by having processing of the second language portion call a request  
11 processing function at the first language portion; and

12 means for executing the request processing function at the first language portion to  
13 process the one or more waiting requests.